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Report of Geo. R. Ewart to Planters' Association.

Conditions in Kauai—Methods of
Handling Cane—Facts
and Figures.

The following is the second part of
the report of the Committee on Cultiva-
tion read at the meeting of the Plant-
ers' Association, November 20th, and
written by manager Geo. R. Ewart of
Kilauea Plantation, Kauai:

Hugh Morrison, Esq.,
Chairman of the Committee on Cul-
tivation.

Our system of cultivation is quite
different to most places on the weather
side of the Islands, as we have to irri-
gate, and we have a little more bad
weather than anywhere else. Being
the most northerly point we are exposed
to the North and North-west winds
as well as the usual trade winds; the
former we dread the worst, as they
have a blighting effect on growing
cane. A 24 hour's wind from the
north or north-west will make cane ap-
pear as though it were drying up for
want of moisture. It causes the change
whether it is dry or wet weather. For-
tunately such winds come only in the
winter time. We have to irrigate in
spite of the fact that we have an aver-
age yearly rainfall for the last 14 years
of 72.17". Most of our rains fall during
the winter months when the tempera-
ture is low and does us no good.

We store water, have three reservoirs
of an area of over 60 acres, and an
average depth of 27 feet. Our soils are
of the "yellow and light red" varieties
and an average depth of about 8". And
while here, let us ask does it pay to
cultivate deep on thin soils? We are
told that yellow and light red soils do
not retain moisture well; that being so
the subsoils retain less and besides
having no capillary power will allow
the water to run through and it is lost
to the plant. We have any amount of
evidence that that is so, for all depres-
sions and gulches commence to run
water as soon as we begin to irrigate
and drain ditches have to be cut in all
such places. In dry summer weather
(and that means hot weather with us
as wet weather means cold) we cannot
get water fast enough on our cane to
get out all there is in the land. What
with the drainage through the soil and
evaporation, both through the cane and
ground, there is no fear of doing
any harm by water. We find that with
deep cultivation (that is using the
steam plow cultivators to a depth of
say twenty inches and cross cultivat-
ing it) the land will take in more
water, but as it runs through it, it is
wasted.

If we could regulate the amount of
water to a nicety, as they do at the ex-
perimental station, it would be all
right, but you cannot do that, as you
cannot depend on the watermen to put
on just so much water, they will fill
the furrow, the only way to prevent it
is not to furrow deep, and we are doing
it for two reasons: one, to reduce the
quantity of water put on at one time,
and the other to give the seed as deep
a soil bed as we can so that some of
the roots will be underneath the seed;
we find that none of them penetrate the
subsoil, they are all lateral from the
seed, so where does deep cultivation
come in, when the subsoil will neither
hold the moisture nor the roots go into
it? The more you loosen the subsoil,
the more water it takes to fill the fur-
row and the more runs to waste. I
may state I know of no plant growing
here that has roots growing in the sub-
soil. We always plow to take up a
little of the subsoil so as to increase
the quantity of soil by each plowing.
We commence plowing in the fall and
harrow each field immediately after-
wards so that when we come to plow
it the second time before planting we
find that the land well broken up and
the second plowing and harrowing
leaves the land clean and well pulver-
ized. With new land we cultivate well
before second harrowing. Land having
manila (Bermuda grass) growing
cannot be harrowed clean, we have to
hoe it out after we furrow. Our fur-
rows are from 5 feet to 5 feet 6 inches
apart.

Before planting we put in the fur-
rows 800 pounds to the acre of pulver-
ized mudpress cake and ashes. It anal-
yses, Phos. acid, 3.16 per cent; Potash,
4.88 per cent; Nitrogen, 1.53 per cent.
Analyzed by Dr. Averdarm of Honolulu.
We then run a single tined cultivator
or subsoiler through the furrow mixing
up the mudpress cake and ashes with
the soil. Seed we place lengthwise in
the furrow and overlapping a little but
care being taken that the seeds do not
touch each other, in case one seed
spoils and affects the other. Cover
lightly, following up with watering im-
mediately and watering afterwards ac-
cording to the weather, very dry, water
again in five days and again in seven
to eight days. Our big cane we try to

water every twelve and fourteen days.
We fertilize after the shoots are up say
twelve inches with soluble fertilizer
containing Phos. acid, 9 per cent; Ni-
trogen, 7 per cent; Potash, 2 per cent,
putting 500 to 800 pounds per acre.
The latter amount in two applications
and in very poor places adding more.
Sometimes Nitrate of Soda or Sulphate
of Ammonia.

SEED.

We find our best seed is good plump
plant cane; there are less misses from
that kind of seed than any other. We
usually cut, say, plant cane this year
and the ratoons of the same cane next
year, fertilizing of course, and if the
stand is good after the second cutting
we fertilize again and use it; but we
always find we do better from the orig-
inal plant cane than from either of
the ratoons.

STRIPPING.

We do this once and in gulches of-
ten. In dry seasons it does fairly well
but it has one big disadvantage with
us, and that is, the amount of dry
leaves that stick tight to the bottom
of the cane, which cannot be knocked
off with a knife, making it bad for
milling and also more costly for cut-
ting.

REPLANTING.

Re-planting, taking the plant cane
we have just taken off, the first field,
350 acres, cost 13 cents per acre to re-
plant. Commenced it June 14th. Sec-
ond field, 337 acres, commenced July
14th. Cost 29 cents per acre. Third
field, 206 acres, commenced August 16,
costs \$1.17 per acre. A great deal of
the last field was not planted until Oc-
tober, as we had to wait for rains.
The above showing is pretty much in
keeping with our other years. Only we
have some cold wet seasons when cane
won't come up good, even in June. Re-
garding early or late planting, with us
all fields planted after August require
more care and are a source of greater
anxiety than fields planted in June,
July and August. Fields planted be-
fore the middle of June are liable to
tassel in November; planted after the
15th we never have any tassels. So we
begin the middle of June and try to
finish in August.

MATURITY OF CROPS.

As is well known in agriculture,
crops mature earlier on light, thin soils
than on deep heavy ones, and so it is
here. All kinds of cane that we have
tried deteriorate just as soon as the
full bloom of the tassel is gone. The
Yellow Caledonia and Rose Bamboo
start in to send out young shoots from
the stool, so that a field of Rose Bam-
boo ratoons of 300 acres cut in March
looked like a field of young cane grow-
ing, the men only cutting the mature
sticks and leaving the young shoots.
The difference in the same field in suc-
crose and purity, taken off in Decem-
ber and March, is as follows: Decem-
ber—Sucrose, 18.25; purity, 91.5.
March—Sucrose, 15.73; purity, 87.3.

The piece taken off in December was
only a small portion of the field—some
eight or ten acres; the March lot was
300 acres. Lahaia does not send up
any young shoots after tasselling; it
simply dries up. The wetter and cold-
er it is the quicker it goes bad and it
is only in very good weather that we
have any laka. Rose Bamboo and Yel-
low Caledonia are both more liable to
be turned over with wind than Lahaia,
especially the Rose Bamboo, the
wind turning it over roots and all, and
like all forced and quick-growing
plants, the sticks are long and spind-
ling and lie down a great deal. Yellow
Caledonia stands up better than Rose
Bamboo. Both Rose Bamboo and Yel-
low Caledonia are quick in starting,
the shoots showing above ground ear-
lier than Lahaia, growing vigorously
right along; keeps a good color all
winter and appears to stand the cold
weather much better than the Lahaia.
Altogether a very pleasing cane
to grow, but terribly disappointing
when you come to weigh it and put it
through the mill. Rose Bamboo grinds
badly in our mill; it seems to re-ab-
sorb the juice no matter how you run
the mill, fast or slow, the hydraulic
heavily weighted or not. Perhaps it
would do better with rolls of smaller
diameter, as the point of contact would
be finer. My opinion of the two varie-
ties is that they require a deeper soil
than we have, and a longer time to
grow. Their success in the uplands of
Hawaii and Kauai would indicate that,
as they get such conditions, viz.: deep
soil and long growth. When we first
got Rose Bamboo and Yellow Caledonia
they were from two to three weeks
later in tasselling than Lahaia, but
now they tassel at the same time.

RATOONS.

Ratoons can never be a sure crop
with us. Our last crop of plant cane
was perhaps the best ever taken off
here and our ratoons one of the poorest.
You will notice the rainfall and
temperature of January, February and
March, 1898, was not cane-growing
weather; a great many of the stools so
rotted that we deemed it better to take
off what we could than to cut back and
go in for long ratoons. From experi-
ence we have never been able to make
long ratoons pay. One thing we no-
tice that whenever for any reason our
plant cane does not grow well from
late planting, bad weather or any
cause whatever, our ratoons are better
than the other fields that have had the
normal crops. It would seem as though
the land was not able to sustain any
more than so much whether plant or
ratoons, and that, in spite of any fer-
tilizers you can put on.

The weather this last spring was
very favorable for ratoons; we had a
dry winter and for the first three
months of this year the mean tem-
perature was 1.52 degrees higher than
the three months of last year, and our
ratoons never looked so well as they
did in the spring; they have got a good
start and we ought to have a good crop.
So to us it would appear that long or
short ratooning is more a question of

soil and weather. We must take off
our plant cane early, as it deteriorates
so soon after tasselling, and the wet-
ter and colder the weather the
quicker we ought to do it; so that with
us we want good weather to ensure us
a good start for our ratoons.

We cultivate our ratoons as follows:
As soon as the trash is burnt off we
start five plows between the furrows;
then when the young cane is high
enough we fertilize with 500 to 800
pounds of the same fertilizer that we
use on the plant cane and with a dou-
ble mouldboard plow we throw the
dirt towards the cane, afterwards ho-
ing it and watering between the cane.
It takes a great deal of water doing it
that way in our thin soil, and we think
that hilling up in the furrow would be
better, and we are going to try that
method next year. The last few years
we have cleaned out all the gulches,
cutting deep ditches up through the
lowest parts, getting down below the
boggy places. Lined them good with
from four to eight barrels per acre, ac-
cording to the condition of the place
we have planted them, and have had
good success. Some parts, where it
was very sour land, the stools of the
ratoons have rotted the first time, but
cultivation improves that.

I must state that with us we must
carry out the old dictum in irriga-
tion, viz.: "Irrigate from the highest
points and drain from the lowest." Every
little hollow or gulch that we plant
we must put in a drain ditch. In
some cases we catch the drainage
water and use it over again, and in one
gulch of about a mile long we use it
over three times. Lining the land is
good; we are trying some experiments
and will be able to give some data af-
ter our crop of 1901. We find we can-
not crop continuously; no amount of
fertilizer (mineral fertilizer) applied
will give us a paying crop, say, after
the first two crops; so we let the land
be planted lie over one year, apply-
ing all the refuse from the mill, waste
molasses, surplus trash, sweepings
from the cane-carriers, blood from the
slaughter-house, stable manure and
night soil from the quarters—anything
and everything that will improve or
make soil we put on the poor places in
fields nearest to where the material is
handy. If we had stable manure to
cover all our lands we might, with
mineral fertilizers, plant them right
along; as there seems to be nothing to
equal a dressing of stable manure
plowed in and mineral fertilizer ap-
plied after the cane comes up. But
stable manure, like trash from the
mill, is very bulky, making it very
costly to handle anywhere but near to
where it is made.

SOILS.

Soil chemists say that the bacteria
that prepare food for plants are active
18 inches from the surface; that being
so, the question of crops ought to
be one of arithmetic on the Islands,
all conditions being equal—depth of
soil, heat and moisture. Dr. Maxwell,
in his work on "Lavas and Soils,"
page 185, gives the following table:

	Approximate Yield Sugar No. of Acres. Per Acre.
Dark red soils	30,000 10,411 lbs.
Yellow and light red soils	32,000 6,291 lbs.
Sedimentary soils	20,000 10,301 lbs.

Most all dark red and sedimentary
soils are deeper than 18 inches, and
I think in tropical countries animal
life goes deeper than in temperate
ones, as cane and grass roots will be
found at a greater depth than 18 in-
ches in dark red soils. So we may take
it that as eighteen inches and more of
good soil is to 10,387 pounds of sug-
(average yield of dark red and sedi-
mentary soils) so is any number of
inches to the answer. Yellow and light
red soils produce more in proportion to
the depth of soil than the dark red,
etc. soils, as, no doubt, the cultivation
has to be more thoroughly done; that
will perhaps give food for thought to
some folk who think and say that cane
raising is only a matter of fertilizers.
Granting that the first six inches of
soil is better than the next six inches
and so on, there is still a big difference
in favor of the yellow and light red
soils; in spite of the fact that dark
red soils have the better climate on
the lee side of the Islands.

I would suggest that there be experi-
ments made on all kinds of soils on
all of the Islands supervised by the
Experimental Station, the same as ag-
ricultural experimental stations and
colleges are doing in other parts of the
world. The work could be done by
the plantations the same as farmers
are doing; but the directing and tabu-
lating of results should be done by
trained men. This thing of having an
experimental station where conditions
of soil, heat and moisture are alto-
gether different to where the greater
part of the Islands crops are grown is
of little use. It is known that Ewa
crops are large per acre; what we want
to know is, can it be done or ap-
proached on yellow and light red soils?
If so, how?

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